Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4230 Cost Determination

The reimbursable Medicaid/MediKan cost of each claim was computed by applying the per day rates (Worksheet D-1) and cost-to-charge ratios (Worksheet C) obtained from the corresponding hospital's cost report, to the covered Medicaid/MediKan days and ancillary charges on the claim.

2.4240 Hospital Specific Adjustments

Medical Education: Indirect and direct medical education costs identified in the cost reports were removed. These were added back as hospital specific medical education rates as explained in section 2.4530.

2.4250 Example to Illustrate Cost Determination

Data

- Medicaid days and charges from a claim (the first and third columns in the routine service table and the second column in the ancillary service table).

- Rates and cost-to-charge ratios from the hospital cost report (the second column in the routine service table and the first column in the ancillary service table).

Computations

Routine Cost = No. of Days x Rate
Ancillary Cost = Charges x Ratio

KANSAS MEDICAID STATE PLAN

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4250 continued

Medicaid/MediKan

Routine Services	Days	Rate	Charges	Cost
Routine	6	$247.70	$1,500	$1,486.20
Nursery	0	300.42	0	.00
ICU	1	399.36	400	399.36
CCU	0	399.36	0	.00
Sub 1	0	247.70	0	.00
Sub 2	0	247.70	0	.00
Subtotal - Routine	Z		$1,900	$1,885.56

Ancillary Services	Ratio	Charges	Cost
Operating Room	0.673302	$ 150.00	$101.00
Recovery Room	0.673302	30.00	20.20
Delivery Room	1.167897	.00	.00
Anesthesia	0.768581	75.00	57.64
Radiology - Diagnostic	0.725719	225.00	163.29
Radiology - Therapeutic	0.725719	.00	.00
Nuclear Medicine	0.587560	.00	.00
Laboratory	0.709475	175.00	124.16
Blood	0.709475	25.00	17.74
Respiratory Therapy	0.338426	.00	.00
Physical Therapy	0.689033	.00	.00
Occupational Therapy	2.700472	.00	.00
Speech Therapy	0.912793	.00	.00
EKG	0.206447	50.00	10.32
EEG	0.206447	.00	.00
Medical Supplies	0.473224	325.00	153.80
Pharmacy	0.437813	400.00	175.13
Renal Dialysis	0.000000	.00	.00
Ultrasound	0.477787	.00	.00
Emergency	1.508338	.00	.00
Subtotal (Used for Other Charges Ratio)		$1,455.00	$823.28
Other Charges	0.56650	.00	.00
Subtotal - Ancillary		$1,455.00	$823.28
Total Medicaid Charges and Cost		$3,355.00	2,708.84

Analysis
In this example, the final cost of the claim is $2,708.84.

Substitute per letter dated 3/7/97

KANSAS MEDICAID STATE PLAN

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4260 Inflation of the Cost and Charge Data

Due to the variety of cost report time periods and discharge dates, the schedule below was used to inflate routine and ancillary data. These were applied to the final costs as determined in Subsection 2.4250.

ROUTINE INFLATION

Hospital FYE	Inflation
12/31/94	5.05%
03/31/94	4.30%
04/30/95	4.05%
05/31/95	3.80%
06/30/95	3.55%
07/31/95	3.30%
08/31/95	3.05%
09/30/95	2.80%
10/31/95	2.57%
12/31/95	2.10%

ANCILLARY INFLATION

Discharge Date	Inflation
07/31/94	4.88%
08/31/94	4.66%
09/30/94	4.44%
10/31/94	4.19%
11/30/94	3.94%
12/31/94	3.68%
01/31/95	3.43%
02/28/95	3.17%
03/31/95	2.92%
04/30/95	2.67%
05/31/95	2.41%
06/30/95	2.16%
07/31/95	1.91%
08/31/95	1.65%
09/30/95	1.40%
10/31/95	1.17%
11/30/95	0.93%
12/31/95	0.70%
01/31/96	0.47%
02/29/96	0.23%
03/31/96	0.00%
04/30/96	-.23%
05/31/96	-.47%

While this amount was applied to routine data, ancillary charges had already been increased by hospitals at their discretion as newer claims data was submitted. Based upon a comparison of the cost to charge ratios used for ancillaries, ancillary cost to charge ratios have generally declined or held steady. Therefore, the adjustment for ancillary charges should only be from the date of the service rather than from the cost report.

The inflation used was based upon a review of various price indices, changes in utilization, changes in case mix, and other relevant information. The inflation rate specifically considers the use of newer cost reports and the continued anticipated decline in average lengths of stay which reduce the cost of the average Medicaid stay.

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4300 Identification of Outlier Claims in the Data Base

2.4310 Mean Costs and Mean Lengths of Stay

After determining costs of all claims in the data base (as discussed in subsection 2.4200), the claims were accumulated by DRG number. The next step was to compute the following for each DRG:

- Mean cost per stay
- Standard deviation of the cost per stay
- Mean length of stay (LOS)
- Standard deviation of the length of stay
- Geometric mean length of stay

2.4320 Establishment of Outlier Limits

Cost and day outlier limits were then computed for each DRG by adding 1.94 standard deviations to the mean as shown in the following formulae:

Cost Outlier Limit = Mean Cost Per Stay + 1.94 x Standard Deviation of Cost

Day Outlier Limit = Geometric Mean Length of Stay + 1.94 x Standard Deviation of LOS

Note: The day outlier limits were rounded down to the nearest whole number because portions of a day were not considered as a full inpatient day.

A claim is an outlier if its cost or length of stay exceeds the cost or day outlier limit respectively. Therefore, the costs and lengths of stay of all claims in each DRG were compared with the cost and day outlier limits established as discussed above for the corresponding DRG, to determine which claims were cost or day outliers.

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4330 Example of Identifying Outliers

Data

	Days	Cost
Claim # 1 -	1	$1,039
Claim # 2 -	1	972
Claim # 3 -	1	916
Claim # 4 -	1	446
Claim # 5 -	2	1,054
Claim # 6 -	2	495
Claim # 7 -	2	1,976
Claim # 8 -	2	743
Claim # 9 -	3	1,131
Claim #10 -	3	923
Claim #11 -	3	2,479
Claim #12 -	3	1,573
Claim #13 -	4	1,234
Claim #14 -	4	1,196
Claim #15 -	4	1,641
Claim #16 -	4	2,749
Claim #17 -	5	1,586
Claim #18 -	5	1,583
Claim #19 -	5	2,341
Claim #20 -	10	3,314

Computations

Total Cost..... $29,391
Mean Cost Per Stay (Total Cost/Total Claims)..... 1,470
Standard Deviation of the Cost Per Day..... 746

Total Number of Days..... 65 days
Mean Length of Stay (Total Days/Total Claims)..... 3.25
Standard Deviation of the LOS..... 2.05
Geometric Mean Length of Stay. 2.70

Cost Outlier Limit = Mean Cost Per Stay + 1.94 x Std. Dev.
= $1,470 + (1.94 x $746)
= $2,917

Day Outlier Limit = Geometric Mean LOS + 1.94 x Std. Dev.
= 2.70 + (1.94 x 2.05)
= 6.68 days
or 6 days

Analysis

Cost Outliers: All claims with costs up to and including $2,917 (the cost outlier limit) are non-cost outlier claims. Claims with costs over $2,917 are outlier claims. Among the above listed claims, only claim #20 is a cost outlier with a cost of $3,314.

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4330 continued

Day Outliers: Claims with lengths of stay of 6 days or less are non-day outlier claims, whereas claims with lengths of stay 7 days and higher are day outliers. Out of the claims listed in this example, only claim #20 with a LOS of 10 days is a day outlier.

2.4400 DRG Relative Weights

The Kansas Department of Social and Rehabilitation Services developed DRG relative weights specific to the Kansas Medicaid/MediKan utilization of general hospital inpatient services. The weights for low-volume DRGs were determined using DRG weights from external data, with preference given to DRG weights derived from populations expected to be similar to the Kansas Medicaid population.

DRG relative weights are used in conjunction with other components of the DRG reimbursement system for computing payment. Determination of payment is discussed in section 2.5000.

2.4410 Data Base Adjustment for DRG Weight Computations

In computing DRG relative weights the cost of each outlier claim (identified in subsection 2.4300) was capped at the outlier threshold for the DRG.

2.4420 Determination of Kansas Medicaid-Specific DRG Relative Weights

For each DRG the following averages were computed from the adjusted data base:

- average cost per stay;
- average length of stay; and
- average cost per day.

The above "average" costs and LOS differ from the "mean" costs and LOS determined earlier in subsection 2.4300. The data base used for the mean costs and mean lengths of stay in subsection 2.4300 included outlier claims, whereas, the above average costs and LOS were computed from the adjusted data base consisting of non-outlier claims and outlier claims capped at the outlier threshold of that DRG (subsection 2.4410).

An "overall average cost" for all DRGs was determined from the adjusted data base. Assigning this overall average cost a weight of 1.00, a relative weight was computed for each DRG based on its average cost per stay determined above, as compared to the overall average cost:

$$\text{DRG Relative Weight} = \frac{\text{Average Cost of the DRG}}{\text{Overall Average Cost}}$$

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4430 Example to Illustrate the Computation of Kansas Medicaid-Specific DRG Weights

Data

This example uses the same data as in subsection 2.4330, "Example of Identifying Outliers". Since claim #20 was determined to be both a cost and a day outlier, listed below are the claims, including the capped outlier claims used in computing the relative weight of this DRG:

	Days	Cost
Claim # 1 -	1	$1,039
Claim # 2 -	1	972
Claim # 3 -	1	916
Claim # 4 -	1	446
Claim # 5 -	2	1,054
Claim # 6 -	2	495
Claim # 7 -	2	1,976
Claim # 8 -	2	743
Claim # 9 -	3	1,131
Claim #10 -	3	923
Claim #11 -	3	2,479
Claim #12 -	3	1,573
Claim #13 -	4	1,234
Claim #14 -	4	1,196
Claim #15 -	4	1,641
Claim #16 -	4	2,749
Claim #17 -	5	1,586
Claim #18 -	5	1,583
Claim #19 -	5	2,341
Claim #20 -	6	2,917

Overall Average Cost: $2,106.68
(All claims in data base)

Computations

Total Cost.....$28,994.00
Average Cost Per Stay (Total Cost/Total Claims).. 1,449.70

$$\text{Relative Weight of the DRG} = \frac{\text{Average Cost of the DRG}}{\text{Overall Average Cost of all DRGs}}$$

$$= \frac{1,449.70}{2,106.68}$$

$$= .6881$$

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4430 continued

Analysis

The relative weight of .6881 in this example means that this DRG is less expensive to treat than the average DRG (with a weight of 1.0000). In other words, it indicates this DRG costs 31.19% less in relation to average DRGs.

2.4440 Modification of Relative Weights for Low-Volume DRGs

If very few paid claims are available for a DRG, any one claim can have a significant effect on that DRG's relative weight, day outlier limit, cost outlier limit, and daily rate. A statistical methodology was used to determine the minimum sample size required to set a stable weight for each DRG, given the observed sample standard deviation. For DRG's lacking sufficient volume in the Kansas Medicaid/Medikan claims data base, the DRG weight was derived using an external data base, with preference given to DRG weights derived from populations expected to be similar to the Kansas Medicaid/Medikan population. Sources used were Oregon Medicaid DRG weights, State of Oregon All-Payor DRG relative weights, and Federal Medicare DRG weights. All externally derived DRG weights were calculated using the same version of the Grouper as was used in calculating DRG relative weights from the Kansas Medicaid data base.

Outlier thresholds and average length of stay statistics for DRG's with externally derived weights were set using the appropriate statistics from the same external source. For DRG's whose weights were derived from Federal Medicare weights, in which case published cost outlier thresholds are based on a substantially different formula than is used by Kansas Medicaid, a least-squares regression equation was used to estimate the outlier threshold, based on the DRG weight.

2.4450 Modification of Relative Weights for Selected DRG Pairs

In cases of DRG "pairs" - one DRG with complications and comorbidity (CC's) and the other DRG without CC's - if the DRG without CC's was weighted higher than the DRG with CC's, the relative weights of both DRG's were replaced with the weighted average of the two relative weights.

2.4500 Group Payment Rates

The Kansas Department of Social and Rehabilitation Services determined group payment rates for the three general hospital groups discussed in section 2.3000. The group payment rates are used in conjunction with DRG relative weights and other components developed for the Kansas DRG reimbursement system to determine payment.

2.4510 Determination of Group Payment Rates

The same adjusted data base as used for DRG weights (subsection 2.4420) was used for developing group rates. Claims were identified by hospital and then sorted by the three groups based on the hospital assignments to groups. All claims were thus divided into three groups.

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4510 (Continued)

In order to adjust unaudited cost reports for the effect of Medicare audits, an audit adjustment factor was determined. This was done by comparing the cost of services from the preliminary 1993 and 1994 cost reports with the Medicare audited cost reports for the same years which were available as of July, 1996. This adjustment was averaged for all hospitals to determine the audit adjustment factor to be applied to each group rate.

Example of An Audit Settlement Comparison
Cost Data for the Fiscal Year Ending 12/31/94

Routine Services	Days	Charges	Unaudited Ratio	Audited Ratio	Unaudited Cost	Audited Cost
Routine	151	27,740	219.36	218.45	33,123	32,986
Psychiatric	0	0	219.36	218.45	0	0
Detox	0	0	219.36	218.45	0	0
ICU	0	0	219.36	218.45	0	0
CCU	5	1,875	219.36	218.45	1,097	1,092
Nursery	44	6,515	188.64	187.72	8,300	8,260
Subtotal - Routine	200	36,130			42,520	42,338
Ancillary Services						
Operating Room		2,992	0.832623	0.827636	2,491	2,476
Recovery Room		150	0.832623	0.827636	125	124
Delivery Room		5,291	1.624450	1.600224	8,595	8,467
Anesthesiology		1,547	0.338158	0.338382	523	523
Radiology - Diagnostic		2,100	0.820164	0.819799	1,722	1,722
Radiology - Therapeutic		0	0.820164	0.819799	0	0
Nuclear Medicine		0	0.820164	0.819799	0	0
Laboratory		7,495	0.635778	0.635706	4,765	4,765
Blood		80	0.513977	0.514555	41	41
Respiratory Therapy		4,495	0.436028	0.435172	1,960	1,956
Physical Therapy		28	0.791218	0.787545	22	22
Occupational Therapy		0	0.803771	0.801252	0	0
Speech Therapy		0	0.803771	0.801252	0	0
EKG		635	0.315497	0.315743	200	200
EEG		0	0.315497	0.315743	0	0
Medical Supply		3,450	0.348991	0.348657	1,204	1,203
Drugs		7,775	0.600985	0.601254	4,672	4,675
Ultrasound		270	0.095519	0.325114	26	88
Emergency		775	2.229117	2.219673	1,683	1,676
Other Charges		0			0	0
Subtotal - Ancillary		37,063			28,053	27,960
Total		73,193			70,574	70,298

Percent Change due to Audited Cost Report 0.39

Methods and Standards for Establishing Payment Rates - Inpatient Hospital Care

2.4510 continued

For each group, total cost adjusted for the effect of audits, total DRG weight (using the weights computed for the DRGs assigned to the various claims), and total number of claims were determined. Using these totals, the average cost and average DRG weight were computed for each group. Next, the average cost divided by the average DRG weight gave the payment rate for each hospital group.

2.4520 Example of Group Rate Computation

The following is a highly simplified example which, while illustrating the methodology used, does not represent actual numbers.

Data

Group 1		Group 2		Group 3	
Cost	DRG Weight	Cost	DRG Weight	Cost	DRG Weight
$1,500	.5000	$1,200	.5000	$1,000	.5000
2,000	.8000	2,000	1.0000	2,000	1.0000
2,500	1.0000	800	.4000	600	.6000
3,000	1.2000	2,500	1.3000		
4,000	1.5000	3,000	1.4000		
1,000	.4000	5,000	1.8000		
6,000	2.2000	1,600	.7400		
4,500	1.4000				
2,500	1.0000				
2,000	.9000				

Computations	Group 1	Group 2	Group 3
Total Cost of Claims	$ 29,000	$16,100	$ 3,600
Total DRG Weight	10.9000	7.1400	2.1000
Total Number of Claims	10	7	3
Average Cost	$ 2,900	$ 2,300	$ 1,200
Average DRG Weight	1.0900	1.0200	.7000
Group Payment Rate	$ 2,660.55	$ 2,254.90	$ 1,714.29

The group payment rate was computed by dividing the average cost by the average DRG weight.